ACKNOWLEDGEMENTS

I express my deepest sense of gratitude and indebtedness to my external supervisor and my boss Dr V. S. RAINA, Principal Scientist, Artificial Breeding Complex, National Dairy Research Institute, Karnal (Haryana) for his meticulous supervision, unflinching interest, constructive counsel, heartily encouragement and generosity, unending inspiration and data analysis during the entire course of investigation as well as preparation of the manuscript.

It gives me pleasure in expressing my deep sense of gratitude to my Internal supervisor Dr Rajbir Singh, Professor, Department of Animal Husbandry & Dairying, Janta Vedic College, Baraut, Baghpat for his valuable suggestion, constructive criticism and heartily encouragement and positive counseling. He had spared his best effort to lead me through the right path and to concentrate my efforts in achieving the goal.

It gives me pleasure to avail the opportunity to convey my heartfelt thanks to Dr Yesh Veer Singh Tomar, Principal, Janta Vedic College, Dr K. P. S. Sangwan, HOD, Dr. D. Gupta, Dr. J. S. Yadav, Department of Animal Husbandry & Dairying and all faculty members of Janta Vedic College, Baraut for providing necessary facilities for the conduct of dissertation.

I am heartily grateful to Dr. A. K. Chakravarty, Incharge A B R C, Dr. T. K. Mohanty, National Dairy Research Institute, Karnal (Haryana) for kindly making available the necessary material for initiating these studies, untiring constant guidance and useful suggestions/criticism during various stages of this research programme.

I avail this opportunity to express my warm thanks to my divisional colleagues Dr. J. K. Pundeer, Mr. J.S. Rana, Mr Nihal Singh, Mr. R. T. Bansode, Mr. Anil Kumar, Mr. Ramesh and Mr. Shyam Singh A.B.R.C., National Dairy Research Institute, Karnal (Haryana).

My heartfelt thanks are due to my close friends Sh. Amit Kumar Singh and Sh. Gulshan Kumar, Research Associates at ABRC, NDRI Karnal,
I am extremely grateful to Dr. A.K. Gupta, PS, ABRC, NDRI, Karnal for their help during the analysis of my data and their useful suggestion from time to time.

I am also grateful to my Dr. (Mrs.) Ranjana Raina for useful suggestions, moral support and encouragement received from time to time.

I express my gratefulness to Smt. Sunita, my wife and Sharesty and Himanshu, my beloved children for their understanding and sharing problems in various ways and encouraging me to finally complete the work.

Place: J V College, Baraut
Date: AUGUST 2011